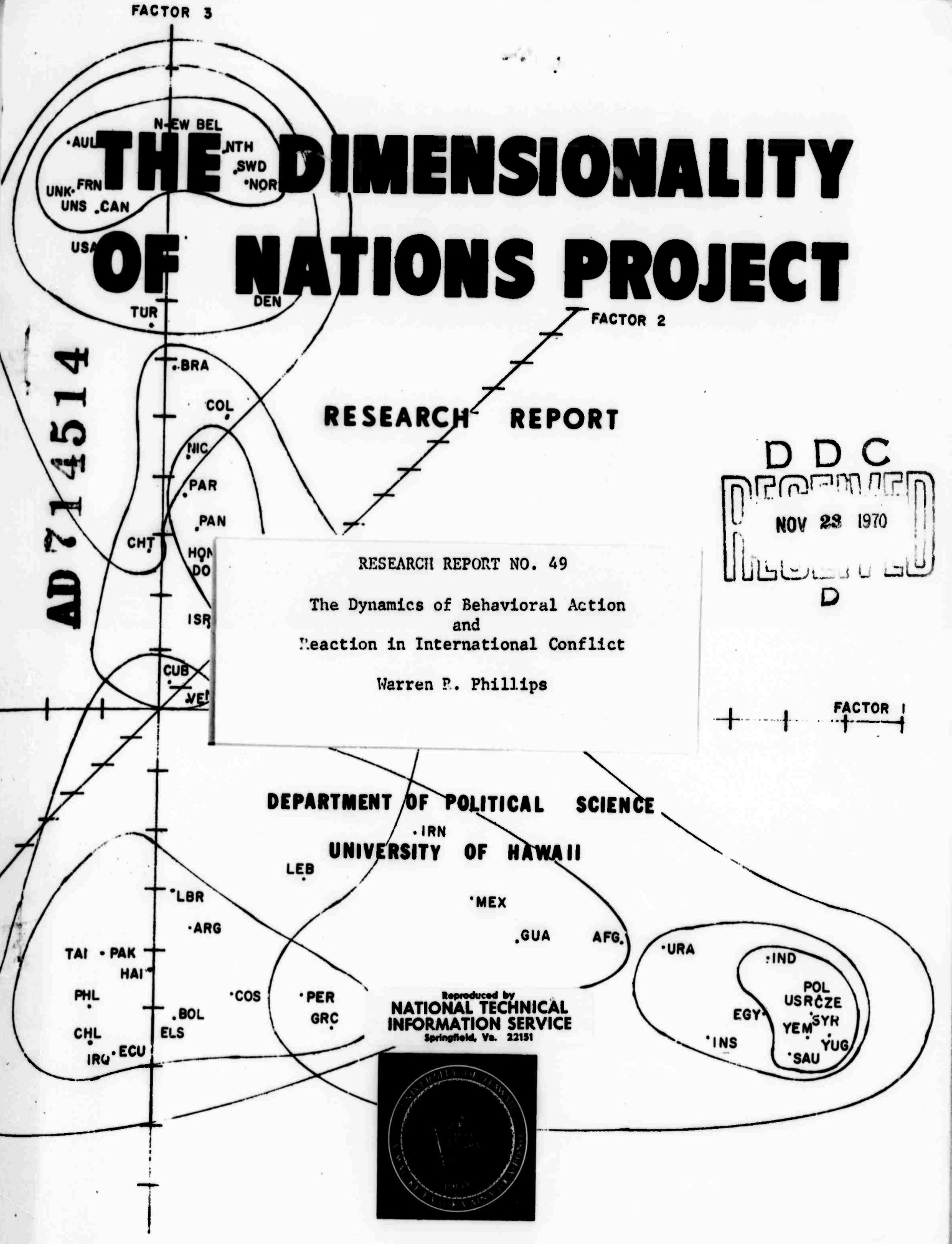

THE DIMENSIONALITY OF NATIONS PROJECT

RESEARCH REPORT

RESEARCH REPORT NO. 49

The Dynamics of Behavioral Action
and
Reaction in International Conflict

Warren R. Phillips

DEPARTMENT OF POLITICAL SCIENCE
UNIVERSITY OF HAWAII

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13. ABSTRACT

The analysis reported ~~on here~~ can be characterized as a dynamic study of international conflict. It is based on the notion that "behavior begets behavior." A series of questions underlie this form of analysis:

(1) What are the dimensions of variation in conflict received by nations from the international system over a series of twelve monthly periods?

(2) What are the time dimensions of conflict sent by nations to the system for the same period?

(3) What are the over time relationships between conflict sent and received by nations?

Answers to these questions were arrived at by ~~resort to~~ factor analysis and canonical regression of conflict data collected from the New York Times for 1963. The data organized on a monthly time basis for the twelve months in 1963. Entities were nation states.

Five factors of conflict behavior were delineated: Negative Communications, Sabre Rattling, Military Violence, Negative Sanctions, and Unofficial Violence. The overall relationship between monthly conflict sent and received for 65 nations in 1963 as measured by the canonical trace correlation was found to be not more than .55. The assumption that nations respond to conflict received in the same month which they receive it was found to be a better explanation of conflict exchanges than the assumption of delayed responses. More specific interrelationships were found for each of the dimensions mentioned above. Possible explanations of the size of overall relationship between conflict sent and received are also discussed in the conclusion.

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The Dimensionality of Nations Project
Department of Political Science
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Dimensionality of Nations Project
University of Hawaii

The Dynamics of Behavioral Action and Reaction in International Conflict *

INTRODUCTION

This research was designed to investigate the over time conflict patterns of nations. In previous papers I have laid out my general theoretical perspective (1970a) and a cross-national analysis of conflict exchanges with the environment (1970b). In the analysis of cross-national conflict behavior the findings indicated a direct relationship between conflict which a nation sends to and receives from the environment. The relationship determined suggested that the environment's responses were in kind. Thus a military initiative of a nation is met with a military response from the environment. For military actions, the responses were parallel.[1] Diplomatic initiatives elicited diplomatic activities, but in this case, the interactions were somewhat more complex. (Phillips, 1970b)

The research discussed in this paper is a dynamic extension of the previous research.[2] A series of questions underlie this form of analysis:

(1) What are the dimensions of variation in conflict received by nations from the international system over a series of twelve monthly periods?

(2) What are the time dimensions of conflict sent by nations to the system for the same period?

(3) What are the over time relationships between conflict sent and received by nations?

The focus is on interaction--on the interplay of conduct--and, therefore, on social process. In the terminology now rising in the inter-

*The author wishes to thank Dr. R. J. Rummel for his critical reading of a previous draft.

national relations field, McClelland, (1966), Rosenau, (1963), Singer, (1961), Snyder, (1954), and Sondermann, (1961), the emphasis is on the workings of the international conflict system more than on the analyses of foreign policies, thereby bringing into focus a large number of the aspects, modes and functions of international political communications. Others have suggested approaches for analyzing this international conflict system. Boulding, (1962), for example, has sketched a static model of competition within which he locates the concept of conflict. Parties to conflict are identified, the "positions" of parties in a behavior space are conceptualized, and conflict is defined "as a situation of competition in which the parties are aware of the incompatibility of potential future positions, and in which each party wishes to occupy a position which is incompatible with the wishes of the other" (p. 5). The result is the identification of the indifference area (or "set"), the conflict area, and the trading or bargaining area. Boulding proceeds to sketch in a dynamic model borrowed heavily from Richardson processes and classical econometrics. Elsewhere I have suggested a dynamic extension similar to Boulding's but employing linear algebra and factor analysis (Phillips, 1970a). The research in this report is a first empirical pass at the dynamics of conflict behavior.

The analysis reported here can be characterized as a dynamic study of the international system. In so defining this study I have accepted Rapoport's definition of "system" and "dynamic."

> Mathematically speaking a portion of the world can be called a system if (1) at any given time the "state" of this portion can be described by a set of values assigned to some selected set of variables, and (2) relations of interdependence can be ascribed to the variables. If, in addition, knowledge of the values of the variables at some initial time and knowledge of the relations among the variables allows us to predict (deterministically or probabilistically) the state of the system at some arbitrary future time, we have a

> dynamic theory of the system. If we can infer only the values of some of the variables from those of others at a specified moment of time, we have a static theory. (1969,pp. 114-5)[3]

Current research efforts have concentrated quite heavily upon conflict behavior. Previous work has provided a good deal of information about conflict in the international sytem over time (Singer and Small, 1967, Denton and Phillips, 1968, Wright, 1942, Richardson, 1960, Moyal, 1949, and Rosecrance, 1963), between select pairs of nations over time (McClelland et al., 1965, McClelland, 1968, North et al., 1967, Whiting, 1960, and Smoker, 1967) or for all nations at a single point in time (Rummel, 1967, and Tanter, 1966). The last work has considered the behavior of nations toward the system (bynation behavior), the behavior of nations aimed at specific opponents (dyadic behavior), or the total behavior of all nations for a given time period (systematic behavior). I will investigate the system's inputs to each object nation (byobject behavior) as well as the bynation conflict behavior by making each observation the total behavior of all nations toward a specific opponent or object nation.

Recently, a conceptual framework which incorporates the environmental concerns of this analysis into a larger milieu has been gaining acceptance in international relations. Rosenau (1969) has suggested that we look at the environmental linkage with the internal processes of nation states. For Rosenau the "environment of a polity is conceived to be equivalent to the same phenomena as comprise any international system of which the polity is a component part" (1969, p. 45). For the purpose of this study. the relevant environment is the international conflict system. For simplicity, consider a three-nation system as in Figure 1. Each pair of actors is engaging in interaction. The conflict exchanged between nations is the conflict environment of nations and the total conflict behavior received

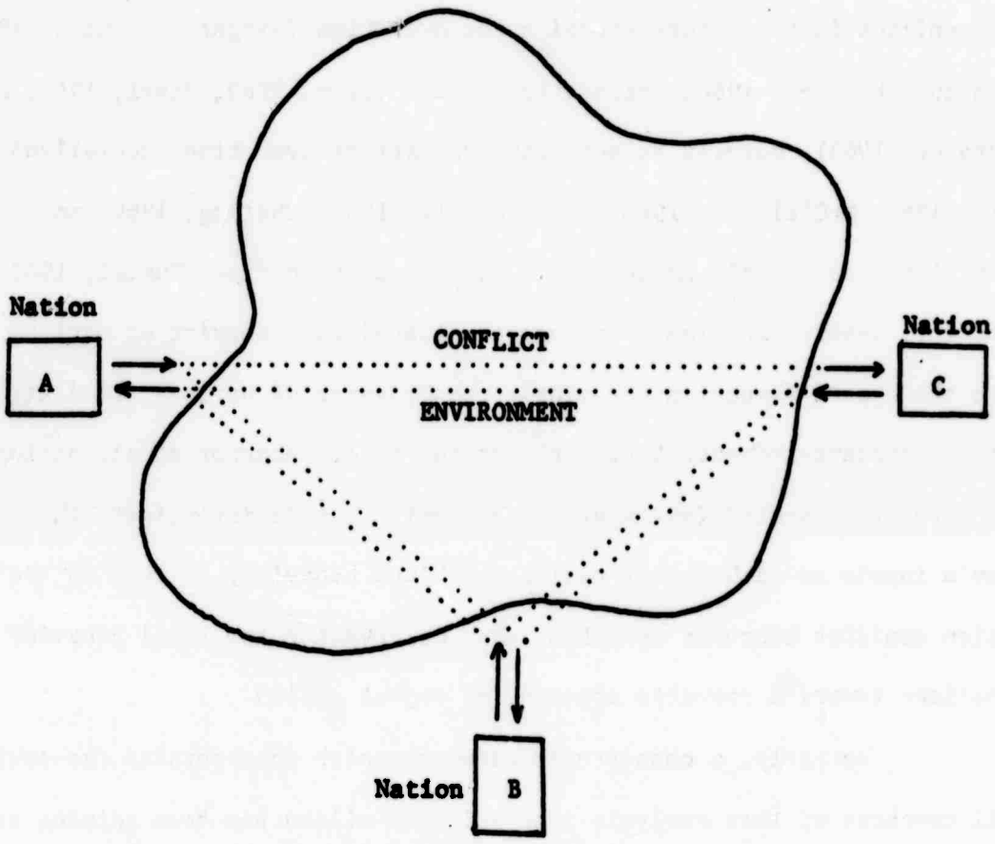

FIGURE I

by a specific nation is the conflict it receives from the international environment.

Karl Deutsch (1968) has suggested that the highest of a nation's basic functions is its ability for self transformation; "to respond to events in its environment in new ways, or at least in different and more rewarding ways" (1968, p. 17). It is assumed in this paper that nations attempting to cope with the conflict received will pattern their responses in ways they believe most rewarding. Thus, changes in the conflict environment of nations influence either the foreign policy decision-making process within nations or the nation's conflict behavior with specific opponents.[4]

The development of a series of variables, each independent of (uncorrelated with) the other would provide a means of testing linkages between conflict inputs and national responses. I will consider these conflict inputs as influences acting upon the normal demand-response sequencing of nations involved in conflict. Thus the amount and type of conflict a nation is receiving from the international system ought to influence its readiness to initiate new conflict behaviors. The linkage between conflict inputs and a specific nation's responses will be made by analyzing the total amount of behavior aimed at a specific nation and the total amount of behavior that nation sends to the international system.

The relationship between simple Stimulus-Response theories and the concept of linkage is supported by arguments from psychology. Charles Osgood (1956), in a review of analytical approaches to psychology, pointed out that all of psychology is a study of what goes into an organism or organization (stimulus) and what comes out(response). The task for all social scientists is the explanation and prediction of relationships among these two sets of observables, stimuli and responses by making certain assumptions

about what goes on in "the little black box" between stimulus and response.[5] Osgood warns about the tendency to collect a different explanatory device for every event to be explained--a process termed "junk box psychology." Ways of elimineting this mass conglomeration of ad hoc explanations have been suggested by a number of scholars.

The linkage between demand and response behavior has been investigated previously in a number of ways. Using perceptual data, but no action data, Zinnes tested four hypotheses about the symmetric relationships between perceptions and expressions of hostility by key decision-makers in the 1914 crisis (1968). The four hypotheses tested were:

> (1) If x perceives itself the object of hostility, then x will express hostility;
> (2) if x perceives itself the object of y's hostility, then x will express hostility toward y;
> (3) if x expresses hostility toward y, then y will perceive that it is the object of x's hostility;
> (4) if x expresses hostility toward y, then y will express hostility toward x. (1968, pp. 86-87)

In commenting on this study Holsti, North and Brody suggest

> Zinnes tested each hypothesis under various time-lag models, using both frequency and intensity of statements. Only hypotheses one and two were supported at statistically significant levels in her study. One interpretation of these findings might be that in crisis 'actions speak louder than words'; that is, in hypotheses one and two, x's perceptions are probably based on both y's actions and y's expressions. Hypotheses three and four, however, are concerned only with the relationship of expressions of attitude and perceptions of these attitudes. Thus, Zinnes' study suggests the limitations of working solely with perceptual data, to the exclusion of action data. (1968, p. 157)

They proceed to test the stimulus-response model further but add perceptual variables as possible medieting forces between action and reaction.

The analysis of the 1914 crisis began with an assump-

> tion basic to most traditional theories of international politics--that is, the assumption of congruence between input (S) and output (R) action. The data revealed, however, a significant difference between the two coalitions corresponding to the different levels of involvement in the situation. Congruence between (S) and (R) was high for the members of the Triple Entente, which became involved only very late in the crisis. The level of congruence was much lower for the nations of the Dual Alliance, which were engaged for essentially the entire crisis period.
>
> Having failed to account for the escalation from a local incident to a general war with only the action variables, the perceptual variables (r) and (s) were analyzed. The various links across the model were examined and no significant difference between the two coalitions in regard to the s-R step was found: (R) was higher than (s) in both cases. As predicted, there was little difference between the Triple Entente and Dual Alliance in the r-s link, both perceiving themselves as less hostile than the other coalition. A significant difference did appear at the S-r step, however. The leaders of the Dual Alliance consistently over-perceived the actions of the Triple Entente. Thus the S-r link served a 'magnifying' function. The decision-makers of the Triple Entente, on the other hand, tended to underperceive the actions of the Dual Alliance. This difference in perceiving the environment (the S-r link) is consistent with the pronounced tendency of the Dual Alliance to respond at a higher level of violence than the Triple Entente. (1968, p. 137)

The symmetry of conflict behavior has also been investigated. Operationalizing symmetry has led to interesting definitional conflicts. Symmetry can be defined as the correspondence in quantity, form and arrangement of conflict input and output or it can be defined as the regularity of pattern or form with reference to corresponding behavior of input and output. It is the latter definition which will be accepted here. Thus, if nations receiving relatively high amounts of a specific conflict behavior, respond with relatively large amounts of the same type of conflict, the relationship is symmetric.[6] No attempt is made to state an equality in the quantity of input and output. In order not to confuse the reader, the term correlation will be used throughout instead of symmetry.

Ed Azar (1970) reasserts the correlation of conflict behavior and tests the relationship on data gathered from an international subsystem composed of Britain, France, Israel, and Egypt from January 1956 through December 1957. He finds conformation for correlation in the level of hostility. Thus when Britain, France, and Israel increased or decreased their level of hostility towards Egypt, the latter responded in a similar manner.

Two further aspects of the relationship of conflict sent to conflict received are worth pursuing at this stage. The first is the potential relationship between conflict sent and received over all nations rather than a selected subsample. Here the possibility exists that a relationship holds for only certain groups of nations and that any theory of conflict interaction would have to include a category system which subdivided nations into groups.[7] Alternatively, if there are strong relationships between stimulus and response behavior in conflict that hold for the system, it may not be necessary to look only at subsets of the international system. This study incorporates all nations which received conflict from the international conflict environment and time patterns of national inputs and outputs over all nations.

A second newaspect of the relationships between conflict sent and received will be investigated by looking at a series of conflict variables. In adopting the approach employed here, I reject the notion that international conflict can be measured by a single indicator such as the number killed or the amount of hostility. Such indicators represent only aspects of conflict, although important ones. I will be looking for the independent patterns of conflict received by nations over twelve monthly periods. Given the difficulty of using single variable indices for any one concept, e.g., poor data with unknown sources of error--random and systematic--and validity problems

of the definitions, students of international relations are faced with the situation similar to Heisenberg's indeterminancy principle in quantum physics. They cannot measure the precise position or "charge" of a nation in the system. I have moved to methods that deal with probability densities that define stable structure among arrays of environmental behavior. Those areas where several variables tend to provide dense clusters of information are most likely to give the best measures for describing international conflict environment.

When one moves from cross-sectional analyses to over time concerns a series of new problems arise in looking for linkages between conflict input and output. Paul Smoker (1969) has suggested a number of possible time relationships worth considering in this form of analysis. One element of conflict behavior is the propensity to send and receive conflict i.e., nations have a propensity to receive conflict from the system if they have in the past. The same statement would apply to nations' tendency to send conflict to the system.

It is also likely that the interaction between conflict sent and received can explain conflict behavior. This interaction can be expressed in three basic forms. It can be instantaneous and thus, conflict received is responded to in the same time period. It is also possible that conflict received precedes conflict sent. In this case nations are responding to their environment. Alternatively, the environment may respond to nations' actions.

The above possibilities can be brought together into five basic relationships for conflict behaviors of nations. These are shown in figure 2. There are several, more complex possibilities such as various lags of two or three months between conflict sent and received or the incorporation of

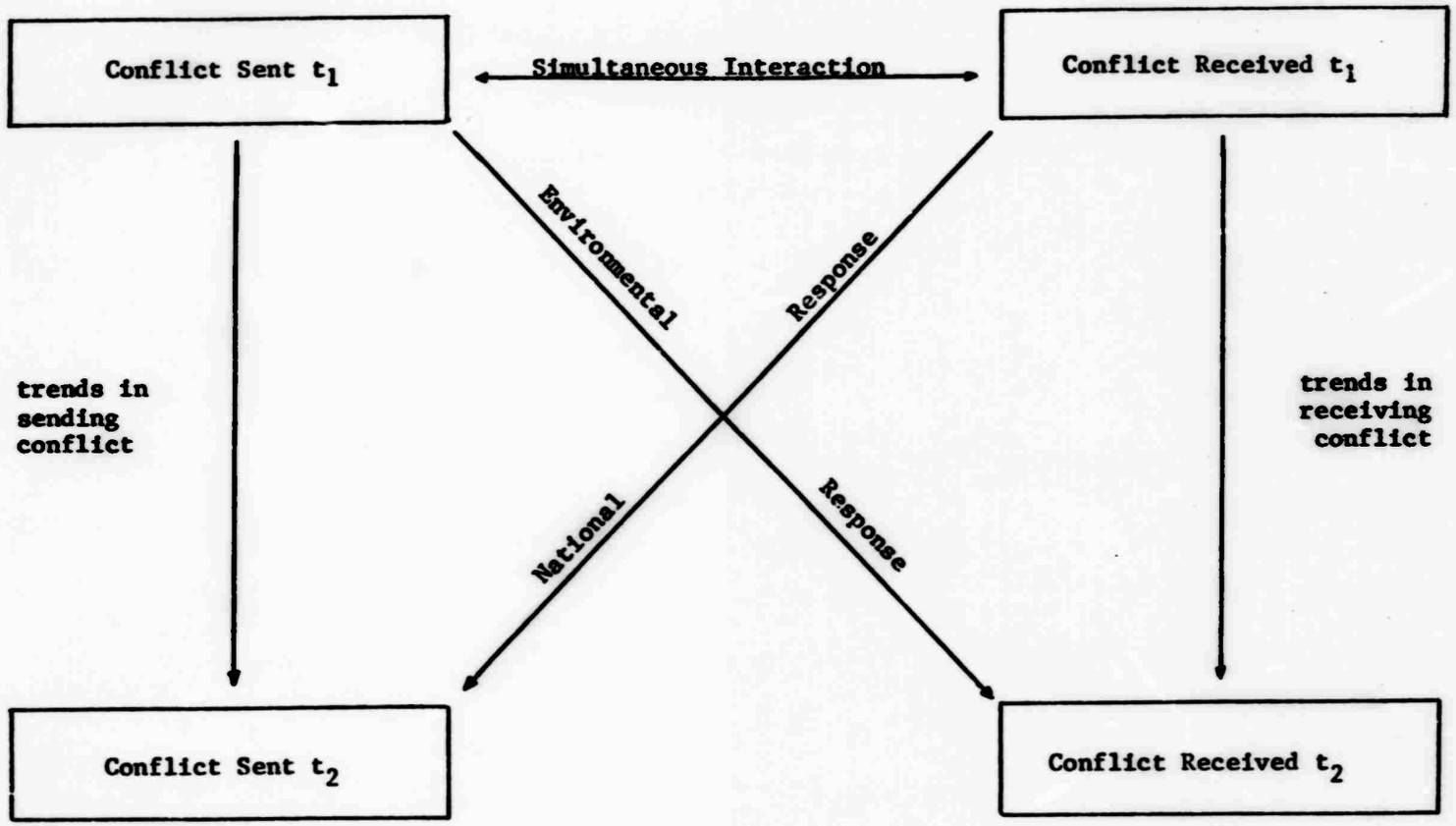

FIGURE II

Conflict Relationships to be Investigated in This Paper

models of memory in predicting conflict behavior. These models will not be tested here due to the lack of data. The basic questions to be asked of the data at this time are: Does the propensity for conflict initiation or reception tend to explain conflict patterns over time or is conflict interaction a more appropriate concept? If it is the latter, then do lags between input and output become important?

THE CONFLICT ENVIRONMENT OF NATIONS

2.1 Conflict Data

The data used in this analysis have been collected from the daily New York Times, using the foreign conflict code sheet given in Rummel (1966). The data were collected by actors, objects, data, and type of conflict act or action. The information contained in the code sheets for 1963 were reorganized into a set of twenty-three conflict variables. Table I presents the twenty-three variables used in this analysis. The variables represent combinations of coded information on the code sheet. The data had to be reorganized from an actor to object frame to a system to object frame and an actor to system frame on a monthly basis.

Turning to the reliability problem associated with the use of a single newspaper, I do not consider that the New York Times provides accurate frequency counts of the amount of conflict between any two nations. In fact I assume the frequency of conflict acts to be an understatement in most cases. Thus, the number of warnings and defense acts between Israel and Jordan may not reflect the actual quantities in a given month. I do consider the source as presenting an accurate pattern of occurrences for each variable over the nations in this study, however. The

TABLE I

DYADIC FOREIGN CONFLICT VARIABLE LIST WITH CODES*

Primary Category	Variable No.	Code	Variable
warning and defensive acts	1	WARNDF	- Military Maneuvers or Troop Movements
	2	ALRTMB	- Alerts and Mobility
official acts of violence	3	PLNVIL	- Planned Violent Acts
	4	WARACT	- Overt Violence
	5	DISCMA	- Discrete Military Actions, Clashes
	6	DAYVIL	- Days of Violence
negative sanctions	7	NEGACT	- Negative Behavior Acts
	8	UNCNEG	- Unclassified Negative Acts
	9	SEVDPR	- Severence of Diplomatic Relations
	10	EXPREC	- Expulsion or Recall
	11	BCOTEM	- Boycott or Embargo
	12	AIDREB	- Aid to Rebels
negative communications	13	NEGCOM	- Negative Communications
	14	WRTCOM	- Written Negative Communication
	15	ORLCOM	- Oral Negative Communication
	16	ACCUSN	- Accusations
	17	PROTST	- Protests
	18	MINTHM	- Minor Themes
unofficial violence	19	UNOFVL	- Unofficial Violence
	20	ATKEMB	- Attacks on Embassy
	21	ATKPER	- Attacks on Persons
	22	ATKFLG	- Attacks on Flag
non-violent demonstrations	23	NVIOLB	- Non-Violent Behavior

*Primary Code sheet categories are separated by solid lines. Variables 1-19 are Official Acts; Variables 20-23 are Unofficial Acts.

correlation coefficient that will be the initial measure of similarity employed in this research, measures the pattern similarity of values for two conflict variables and not the magnitude similarity. Thus, if two variables measuring conflict behavior have the same pattern, they will be perfectly correlated. Figure 3 depicts this relationship.

Some question has arisen as to the reliability of a single newspaper. Any newspaper, no matter how large, is confronted with the problems of editorial decisions and national biases. It is argued that a data source using several newspapers would minimize this bias. McClelland et al. (1965) employed newspapers from five different countries. In his study of the Taiwan Straits conflict he found the same pattern of conflict represented in the five newspapers studied as were found by Sullivan (1964), his study employing only the New York Times Index. In another investigation, Gamson and Modigliani (1965) studied the reliability of the New York Times reporting of U.S.-Soviet behavior. They found in the comparison of nine different papers that while the New York Times correlated highly with the patterns of conflict reported, the quantity of reports was much higher in the New York Times than any other newspaper.

The New York Times is a source of readily available data in international relations. Its use is gaining a good deal of investigation. Smith (1967) attempted to ascertain whether the New York Times was as good a source as other non-newspaper sources. He compared the New York Times with the Indian White Paper on the Sino-Indian border crisis and found that when one uses correlational procedures, the New York Times is an accurate representation of the patterning of conflict behavior. The availability of records from the foreign offices of various nations is not sufficient to make further tests of these assumptions feasible at this

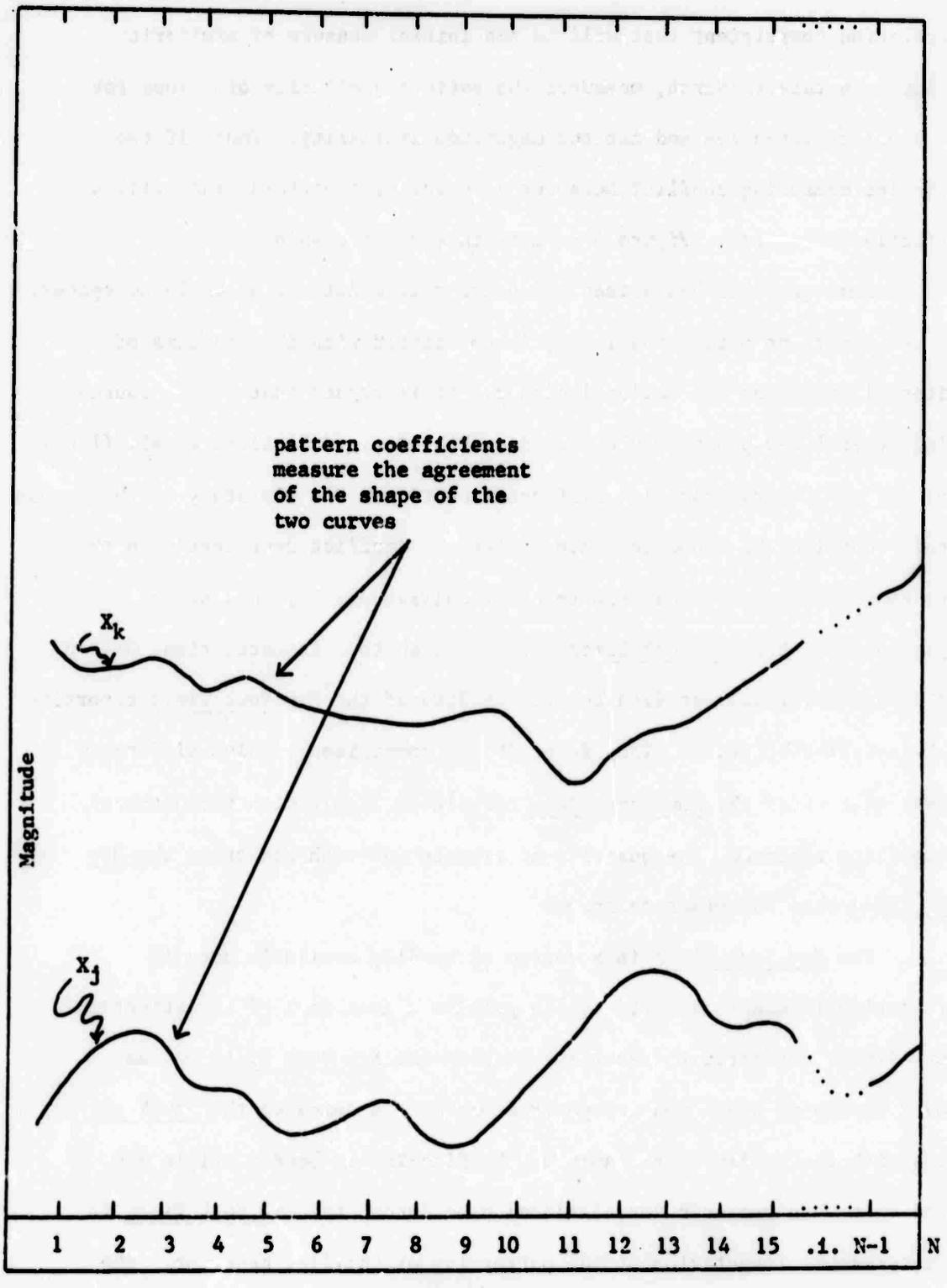

FIGURE III. PATTERN COEFFICIENT

time. No doubt, more effort must be expanded in this task, however. The above information seems to lend support to the choice of the New York Times as a single source of data, at least at this stage of analysis.

2.2 The Patterns of Overtime Conflict Behavior

As previously stated, my interest is in the time pattern of national inputs and outputs to and from the environment. Using the analogy of a camera, I prefer a number of instantaneous pictures over the same time period than one single exposure. Such a procedure--much like a movie camera--would not only identify structures or patterns in national conflict inputs and outputs which do not change over time, but it would also identify moving objects or patterns that change over time. Such a technique is currently available. In order to analyze all aspects of a data cube--nations, behavior, and time shown in figure 4--I will cut a series of monthly slices from the data cube. Each slice will be an R-matrix of variables across objects. Then, the slices can be stacked in "freight car" fashion, one behind the other. This procedure produces a super matrix with columns equal to the number of conflict measures and rows equal to the number of object nations times the number of time periods (see figure 5).

This super matrix can be factor analyzed to delineate patterns of interrelationships between conflict measures over both time and objects. The factor technique, termed Super P-analysis combines both the over time variance and the over object variance down the columns of the matrix.[8] The factor loading matrix resulting from analyzing this Super P-matrix will delineate the interrelationship between the conflict measures over the series of monthly slices. These interrelationships are not strictly based upon variation in time or variation among object nations, but account

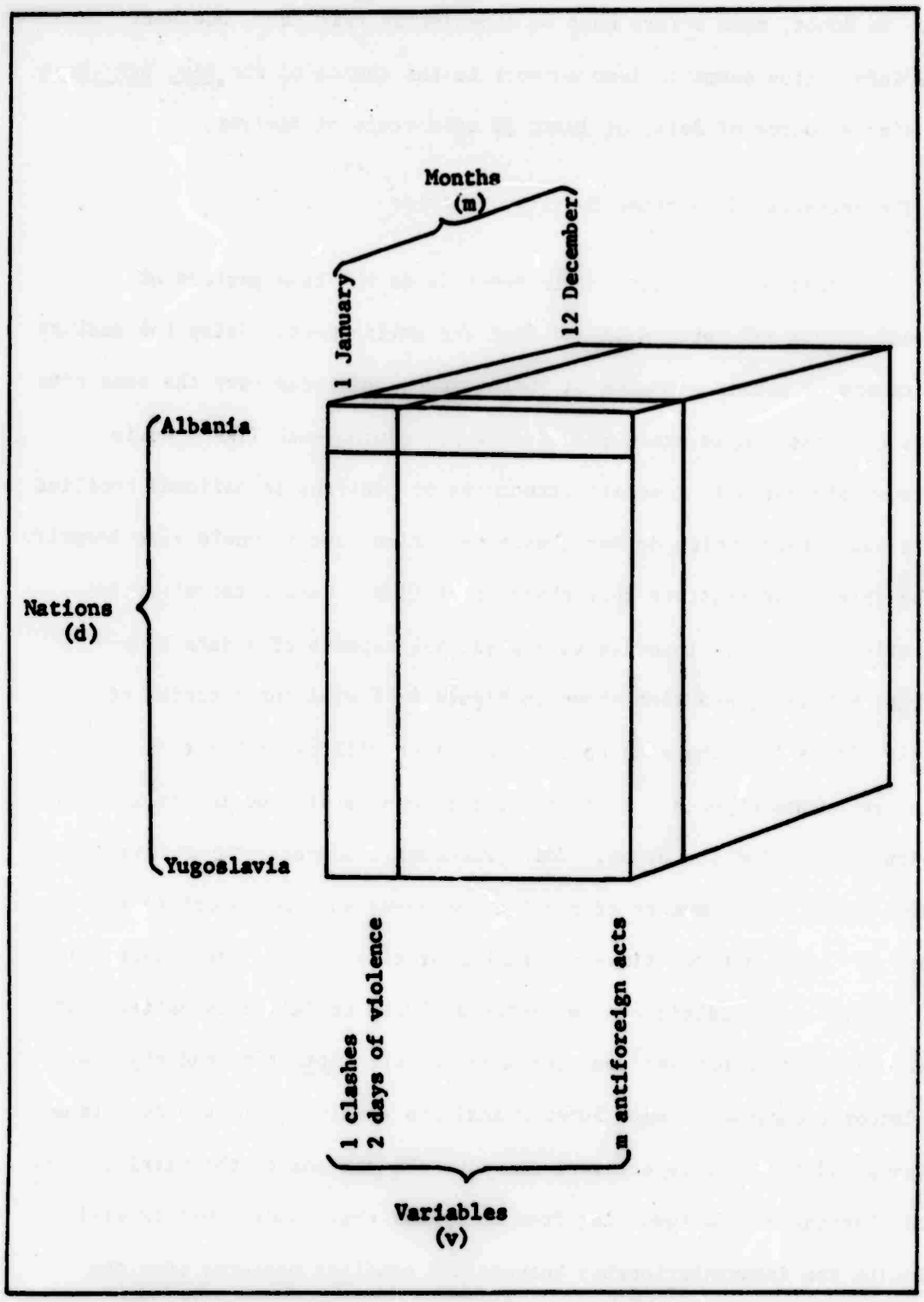

FIGURE IV. DATA CUBE

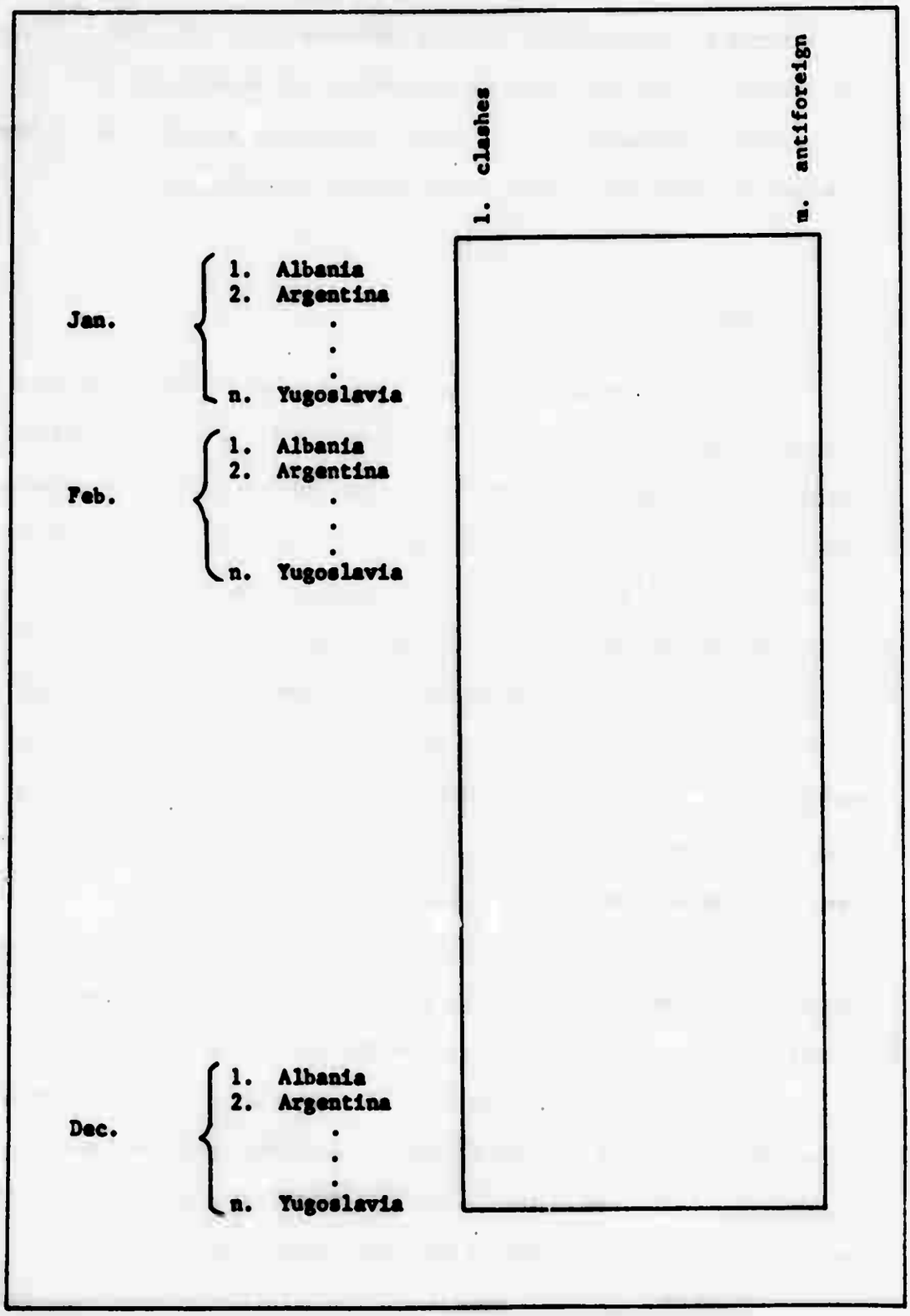

FIGURE V. ORGANIZATION OF THE SUPER P-MATRIX

for patterns of environmental conflict measures which vary over both time and objects. A pattern (factor) score matrix can be computed from the loading matrix discussed above. These two matrices are laid out in figure 6. This pattern score matrix will give a monthly score for each nation on these patterns.

2.3 The Conflict Received

In order to ascertain the basic patterns of conflict that form the environment of nations for the twelve months in 1963, a factor analysis was performed on a matrix of twenty-three variables over sixty-five objects for twelve time periods, or 780 rows. Each row recorded all behavior which was directed at a specific nation for a month in 1963.

In choosing the sample size I was faced with several possibilities. There were 107 nations meeting normal D.O.N. project criteria for nationhood in 1963. Of these seventy-three nations received conflict and eighty-two nations sent conflict. Moreover ninety nations sent or received while sixty-five nations both sent and received conflict. The sixty-five nations which both sent and received conflict were employed in this study.

The variables in this study were intercorrelated using product moment coefficients and factor analyzed.[9] The technique employed was principal component analysis since the specific variance is important in the description of conflict behavior. In addition, I plan to employ the factor scores derived from the factors of conflict reception, and the component model allows better estimates of the true factor scores than would other techniques such as common factor analysis (Rummel, 1970).

Table II displays the unrotated (principal axis) matrix of environmental conflict. The first five factors account for sixty-three percent of

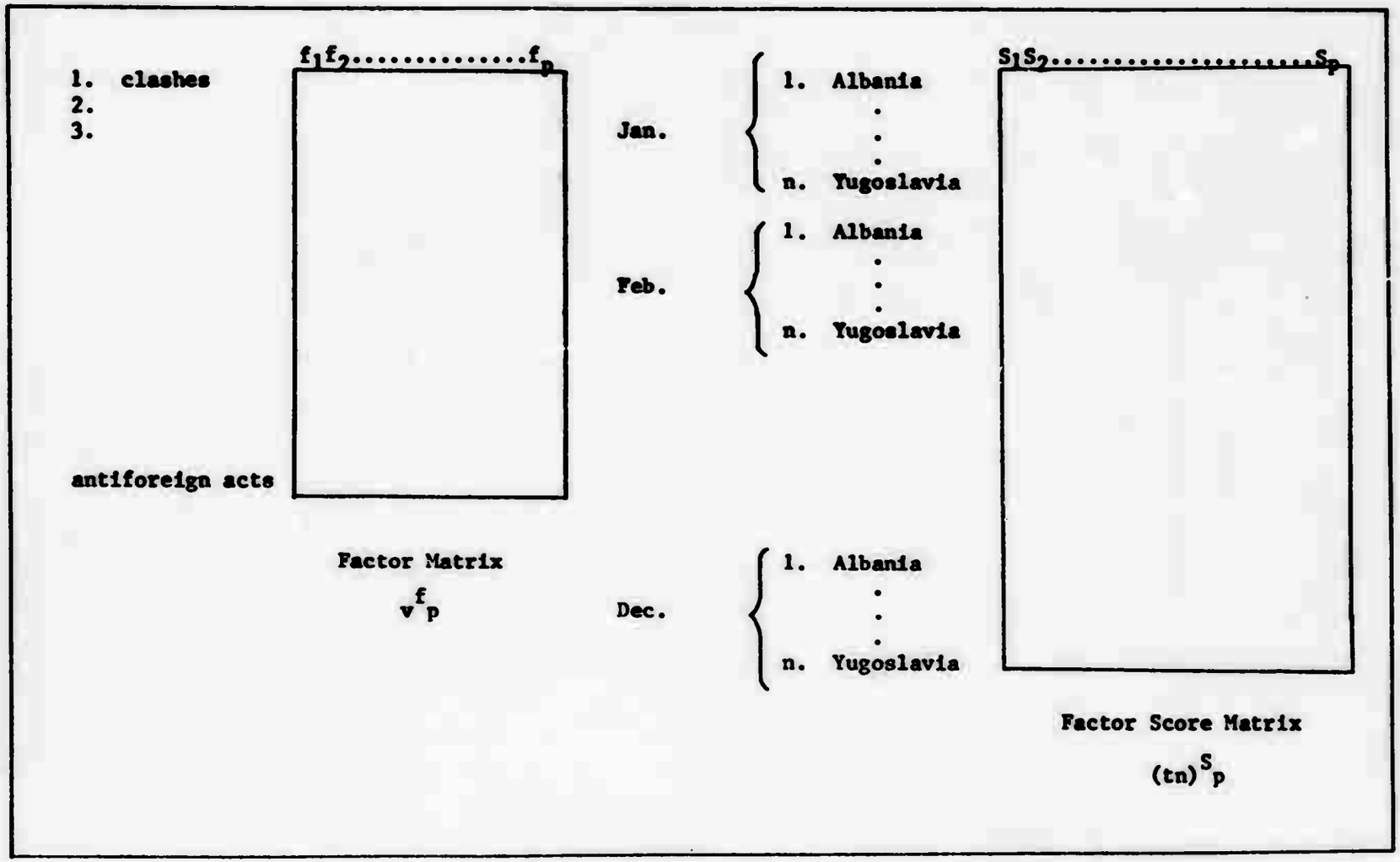

FIGURE VI. ORGANIZATION OF THE FACTOR LOADING AND FACTOR SCORE MATRICES IN SUPER P-ANALYSIS

TABLE II

CONFLICT RECEIVED PATTERNS[a]

VARIABLE	FACTORS I[b]	II	III	IV[c]	V
WARNDF			72		
ALRTMB			72		
PLNVIL		89			
WARACT		91			
DISCRA		84			
DAYVIL		59			
NEGACT			63		51
UNCNEG					
SEVDPR			55		
EXPREC					
BCOTEM					
AIDREB					
WRTCOM	91				
ORLCOM	71				
WRTORL	70				
ACCUSN	85				
PROTST	63				
MINTHM	52				
ONOFVL	78				
ATKEMB					
ATKPER	58				
ATKFLG	73				
NVIOLB	51				

[a]Principal component analysis, principal axis solution

[b]all loadings x 100 only those above 50 reported

[c]no variables loading above 50.

the total variance of the original matrix. There is neither a general factor nor a series of bipolar factors commonly found in principal axis solutions. That no common factor on which all variables loaded highly appeared indicates the lack of a general conflict received pattern which accounts for the conflict experienced by nations. The lack of a bipolar factor indicates that there is no inverse relationship between sets of variables such that nations experiencing an above average amount on one conflict variable are not generally experiencing a below average amount of another variable.

Principal component analysis generally produces as many factors as there are variables in the original matrix. While this is generally true there seems to be a clear rationale for limiting our discussion to the first five factors. There were seven factors with eigenvalues above 1.00, but factors six and seven were not easily named and represented collections of variables already loading on factors one through four. There were no loadings above .50 and the addition in variance accounted for--about ten percent--did not seem to warrant substantive naming.[10]

When the dimensions are rotated to a more invariant solution, it is more convenient to substantively label the factors. While the unrotated factors define the most general factors in descending order of generality, the rotated ones delineate distinct clusters of interrelationships when they exist in the data. Orthogonal rotation defines patterns which are uncorrelated with each other. These patterns identify clusters of variables which exhibit similar behavior over dyads for successive months. The rotation technique employed was the varimax method as described in Harman (1967, p. 304). Table III presents the varimax loading matrix.

The first orthogonally rotated factor appears to be a negative communications factor. It accounts for eighteen percent of the variance in

TABLE III

ROTATED PATTERNS OF CONFLICT RECEIVED[a]

VARIABLE	h^2	FACTORS I[b]	II	III	IV	V
WARNDF	93			95		
ALRTMB	93			95		
PLNVIL	89		93			
WARACT	91		94			
DISCRA	77		87			
DAYVIL	38		62			
NEGACT	96					94
UNCNEG	25					84
SEVDPR	50					75
EXPREC	24					
BCOTEM	17					87
AIDREB	34					
WRTCOM	95	91				
ORLCOM	73	84				
WRTORL	58	69				
ACCUSN	82	83				
PROTST	59	74				
MINTHM	39	61				
UNOFVL	89				87	
ATKEMB	36					
ATKPER	75				84	
ATKFLG	74				74	
NVIOLB	27					

[a]Verimax criteria for rotation

[b]all loadings x 100. Only loadings $\geq$ 50 reported. Complete tables presented in the appendix.

the matrix. The second factor is a pattern of official military violence received by nations from the environment. The third factor accounts for warning and defensive acts or sabre rattling and the fourth factor seems to be a pattern of unofficial violence. The final factor accounts for negative sanctions. These five make up the basic patterns of variation among conflict received by nations.

2.4 Conflict Output of Nations

The same analysis was performed on the conflict output of nations for 1963. In this analysis a matrix of twenty-three variables over 780 rows was developed to account for the bynation conflict of the sixty-five nations which received and sent conflict in each of the twelve months in 1963. This matrix was intercorrelated and factor analyzed to delineate the patterns of conflict output from nations to the environment. The principal axis solution, presented in Table IV, shows that there is neither a general conflict output dimension nor a bipolar factor. These findings are similar to those for conflict input to nations from the environment.

Turning to the varimax solution, five factors accounted for fifty-six percent of the variance in conflict output. Table V lists the factor loadings in this matrix. The factors again account for Negative Communications, Official Military Violence, Unofficial Violence, Negative Sanctions, and Sabre Rattling.

2.5 The Stability of Patterns of Conflict

The variation in conflict behavior has been analyzed in a number of different modes for 1963. Cross-sectional analysis for 1963 dyadic (Hall and Rummel, 1969), bynation (Oliva and Rummel, 1969) and byobject

TABLE IV

PATTERNS OF CONFLICT SENT[a]

VARIABLE	FACTORS I[b]	II	III	IV	V
WARNDF					71
ALRTMB					76
PLNVIL		82			
WARACT		83			
DISCRA		79			
DAYVIL		55			
NEGACT				61	
UNCNEG					
SEVDPR					
EXPREC					
BCOTEM					
AIDREB					
WRTCOM	87				
ORLCOM	67				
WRTORL	55				
ACCUSN	71				
PRCTST	62				
MINTHM					
UNOFVL			65		
ATKEMB					
ATKPER					
ATKFLG					
NVIOLB					

[a]Principal component analysis, principal axis solution

[b]all loadings x 100 only those above 50 reported

TABLE V

ROTATED PATTERNS OF CONFLICT RECEIVED[a]

VARIABLE	h^2	FACTORS I[b]	II	III	IV	V
WARNDF	93					95
ALRTMB	93					96
PLNVIL	89		94			
WARACT	91		95			
DISCRA	77		87			
DAYVIL	37		60			
NEGACT	95				95	
UNCNEG	60				74	
SEVDPR	35					
EXPREC	31				53	
BCOTEM	27				51	
AIDREB	12					
WRTCOM	94	96				
ORLCOM	70	83				
WRTORL	36	59				
ACCUSN	70	84				
PROTST	48	67				
MINTHM	22					
UNOFVL	92			94		
ATKEMB	45			66		
ATKPER	46			68		
ATKFLG	52			72		
NVIOLB	10					

[a]Verimax criteria for rotation

[b]all loadings x 100. Only loadings $\geq$ 50 reported. Complete tables presented in the appendix.

(Phillips, 1970b) have now been finished. In addition, over time analysis has been accomplished for monthly dyadic conflict (Phillips, 1969) and for bynation and byobject data. In an earlier report (Phillips, 1969) I also analyzed quarterly conflict behavior for dyads in 1963. These analyses show five patterns of conflict behavior for 1963 which are stable over a series of different analytic cuts at data organization and whose stability is independent of cross-sectional or over time patterns. The implication here is that it would appear that we may have state variables[11] in delineating conflict behavior. This ability is somewhat novel for students of international relations, and if true we are on much more general grounds than earlier single variable analysis of variation in time.

There is one preliminary analysis for over time dimensions for a longer period of time. In his dissertation (forthcoming), Dave McCormick has analyzed the same twenty-three conflict variables over all months from 1962-1968, a total of seventy-two months. In his analysis of dyadic conflict over that period, he found the same patterns of conflict behavior. The trace correlation between his patterns and those found for dyadic conflict behavior for the twelve months of 1963 was .97.[12] Thus it would appear that we may generalize to more periods than 1963 with regard to the patterns of conflict for the international system. Of course, the actual scores of individual nations would vary from period to period but the total effect of these shifts in individual nations' behavior washes out at the aggregate level.

One other substantive interpretation can be made at this point. The five forms of conflict behavior can be grouped into three general sources of conflict. Negative Communications and Negative Sanctions will be called the diplomatic conflict variables as they are normally associated with

strategies initiated in diplomatic offices. Sabre Rattling and Official Military Violence are military conflict variables since these actions are associated with defense departments. Finally Unofficial Violence is not publicly associated with the governments of nations but rather rests in the people or subgroups within the population.

Here it is important to keep in mind that the military violence and diplomatic acts may not be associated with the same target or be received from the same actor. For instance, the United States may receive negative communications from the Soviet Union and military violence from North Vietnam. She may respond by sending negative communications to China and military violence to North Korea. What would be recorded in this analysis is that the United States received both negative communications and military violence and she employed both acts herself. These coefficients specify the linear combinations of acts sent which are maximally related to linear combinations of acts received.

2.6 Conflict Interaction

The analysis of 1963 conflict sent and received produced matrices of factor scores. Each nation has a score on the five conflict patterns of input and five patterns of output for each of the twelve months. By comparing the conflict sent and received using a number of different variations in lags and leads we ought to be able to ascertain the interaction between conflict input and output as well as the tendencies to continue using previously set input or output patterns. The comparisons were made by canonical regression analysis. Canonical analysis ascertains the maximum linear relationships between each set of factor scores. If the patterns are identical in both input and output scores there would be a perfect one-to-one

matching of dimensions from each conflict space.

Let us begin by assuming that conflict sent is a linear transformation of conflict received.[13] This statement can be rewritten in matrix algebra as

$$S_{mxq} = R_{mxp} P_{pxq} \tag{1}$$

where m is the number of nations (65 in this case), R is the number of patterns of conflict sent, q the number of patterns of conflict received (in this case q = p). Then S is a matrix of Conflict Sent, R of Conflict Received and P is the matrix of parameters which link conflict received to conflict sent.[14]

While equation (1) is a deterministic statement about the relationship between behavior sent and received, a measure of the degree to which it represents our observations will be an important indicator in assessing the empirical relationships.

Deviations between (1) and what we find in a particular empirical domain can be denoted as

$$U = S - S^* \tag{2}$$

where U is the deviations, S^* is the conflict sent estimated from conflict received R and parameters P. In application empirical observations give us the following equation

$$S = RP + U \tag{3}$$

Since the parameters have not been evaluated apriorally we are free to select P that is best in some sense. It is common to select P such that U in (3) is minimized. But I have two goals in this work; first, to determine the empirical fit of the conflict sent to conflict received spaces, and

second, to determine a set of conflict received indicators which best account for conflict sent.

Thus I seek a method which evaluates both S and R and yields behavioral dimensions of each which have a maximum correlation. I will be searching for linear transformations of both S and R. To define this requirement let us define Y and V.

$$Y = ST \tag{4}$$

T is a linear transformation matrix and

$$V = RP \tag{5}$$

then

$$\begin{aligned} ST &= RP + U \\ Y &= V + U \end{aligned} \tag{6}$$

where $Y_k'V_q$ = maximum correlation (7)

$Y_k'V_q = 0$ when $k \neq q$[15]

$Y_k'Y_k = V_q'V_q = 1$,

and Y and V are orthogonal. The latter will simplify whatever relationship between conflict sent and received is established.

A solution to this problem is at hand since (6) with restrictions (7) is the canonical model (Hooper, 1959). Canonical analysis solves for the best fitting Y and V from S and R. V will give the parameters of P best in the sense of minimizing U and Y will give the dimensions of S having the best correlations with conflict received.

The sum of the squared correlation between conflict dimensions Y_k' and V_q where $k = q$ gives the variance in conflict sent, S, explained by conflict received, R. The empirical fit of S to R-space is then

$$\bar{r}^2 = \frac{1}{q} \sum_{k=1}^{q} \left(\frac{1}{m} Y_q' V_r\right)$$

where q = k. The coefficient $\bar{r}^2$, which is called the trace correlation squared (Hooper, 1959), measures the proportion of variance in S accounted for in R.

In order to do a canonical analysis on conflict sent and conflict received at different points in time, some modification of the original matrices was made, i.e., one matrix represents conflict for the earlier time while the other matrix represents conflict for the lagged time periods. The first matrix includes five (5) factors over 65 nations x 11 months (January to November) of 715 rows. The second matrix is similar except that the months would run from February to December. Thus, conflict behavior at time one is compared with behavior at time two for each of the 65 nations. Figure 7 displays the organization of these matrices.

Turning to the results of this analysis, there were five time aspects of conflict which were investigated. These five aspects of conflict time relationships are shown in figure 8. The values in parentheses are the trace correlation squared which delineate the percent of variance in common between the two spaces.

Is there a trend in conflict sent or received? There is a mild tendency to receive the same conflict from one month to another. About twenty percent of the variance in the time lag is held in common. There is less tendency to maintain conflict sent patterns from one period to the next as shown by a trace of .39 or fifteen percent of the variance is held in common. Turning to the relationship of conflict sent and received, the model for simultaneous interaction explained twice as much variance than either of the lagged models. Even then, the amount of variance held in common is only thirty percent. It would appear that nations respond quickly to conflict when they respond and that there is no clear indication,

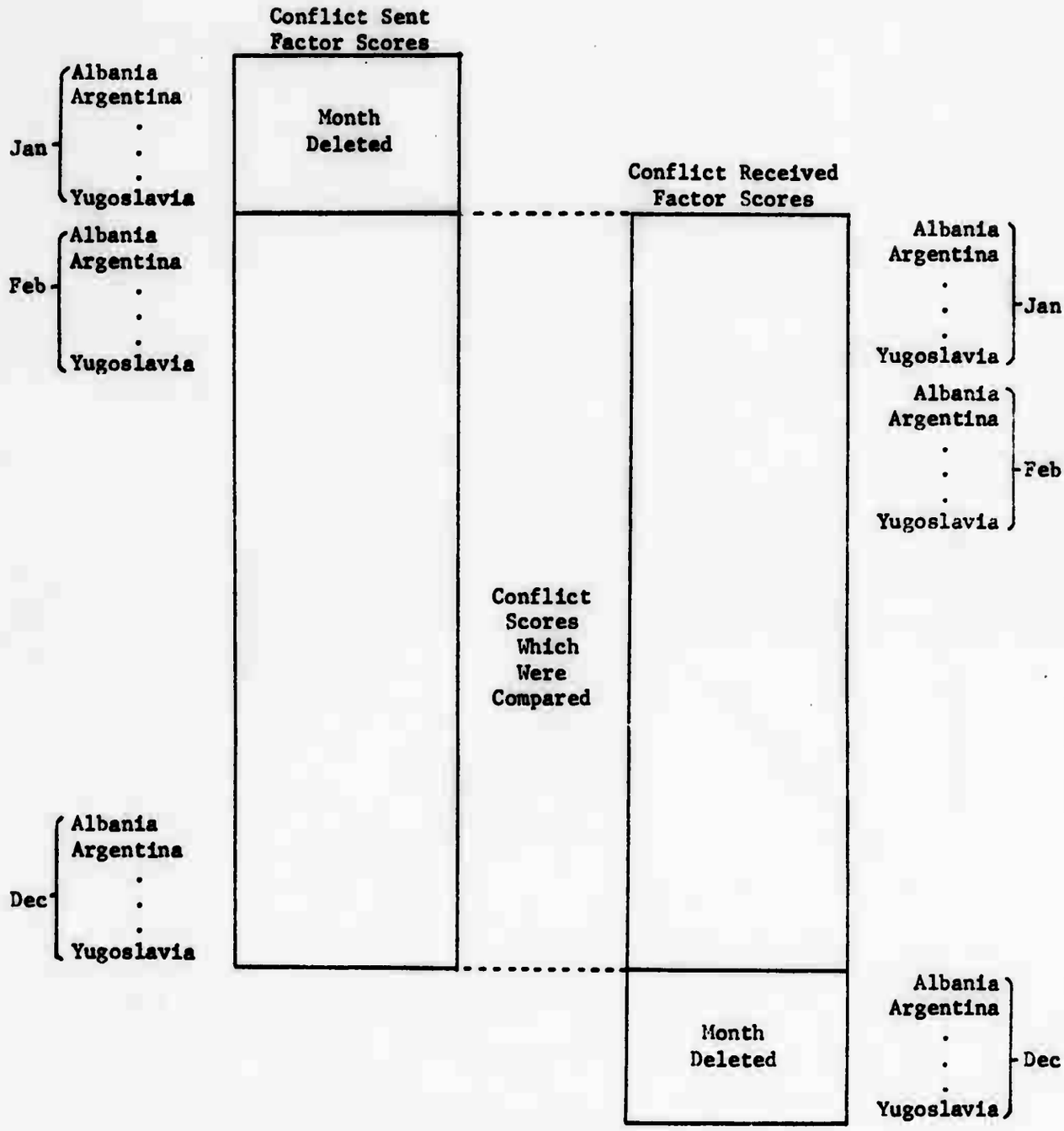

FIGURE VII
ORGANIZATION OF MATRICES TO STUDY
TIME LAGGED RELATIONSHIPS IN CONFLICT BEHAVIOR

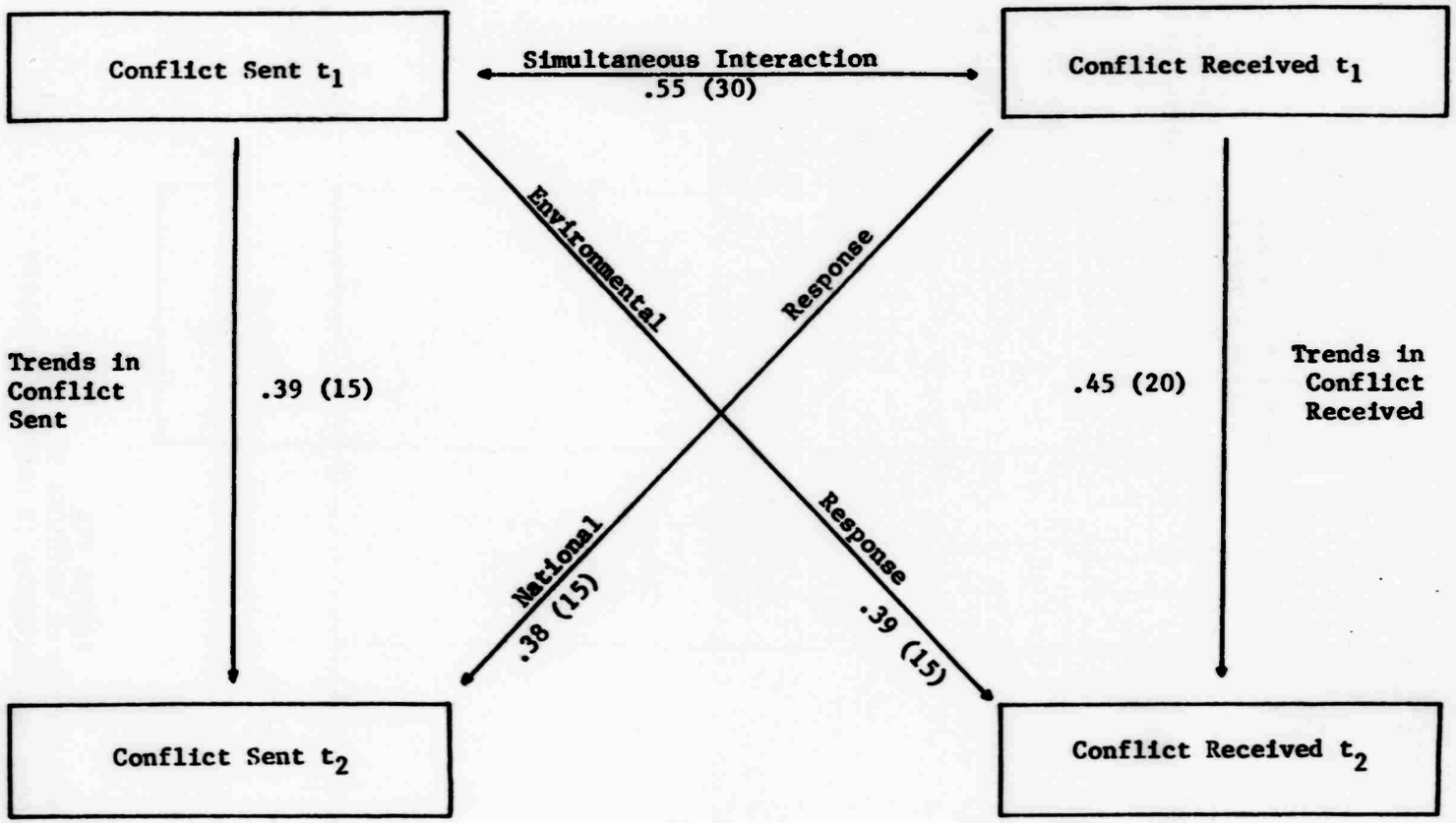

FIGURE VIII
CONFLICT RELATIONSHIPS[a]

[a]coefficients are trace correlations from canonical analysis. The trace squared or the Percent of Variance Explained is in parentheses.

on the systemic level, for a dynamic pattern of conflict interaction.

This finding is in contrast to analyses of cross sectionally organized data. In a similar analysis for data on conflict sent and received for the same sixty-five nations in 1963 the trace correlation was .80 or sixty-four percent of the variance in conflict sent was reproduced by knowledge of conflict received (Phillips, 1970b). In this earlier analysis, the variance accounted for was over nation observations for the year. It would appear that the patterns of conflict sent and received are quite similar for nations in a year but the dynamics of these relationships are not so systematically related. In other words, those nations which receive relatively large amounts of conflict tend to initiate relatively large amounts of violence when the conflict is aggregated yearly. Short run--monthly--comparisons of conflict sent and received point out that a good deal of the relationship of behavior sent and received is unique.

These findings are somewhat disappointing for it was thought that there would be a higher relationship between conflict sent and received when analyzed dynamically, given the encouraging results of the static study. Upon reflection, there are three plausible explanations.

The first possibility is that some conflict acts are responded to at once, some after a lag of one month, some after two months, etc. Therefore, at the monthly level little relatioship would appear. If so, delineating appropriate response times requires that nation dyads be the unit of analysis in order to break down the conflict into strategies which a nation employs with various opponents.

Another possibility is that some aspect of the data organization procedures would explain the inability to find high correlations at this level. This explanation implys that the correlations found were artifacts

built into the analysis by the form of data organization. As a check on this possibility, the significance of the individual correlations can be consulted. In ascertaining the significance of a correlation, the chi square is employed. The chi square equals

$$- [n - 0.5 (p + q + 1)] \log_e \Lambda,$$

where n = number of nations x months, q the number of columns in the left hand matrix of behavior, p = the number of columns in the right hand matrix of behavior, and

$$\Lambda = \prod_{k=1}^{q} (1 - r_k^2)$$

where r^2 is the kth squared canonical correlation. Then by computing Z transformations to areas under the normal curve, the test significance of the correlation can be inspected. Here the question asked concerns whether the strenth of the correlation places it in the region of scores which depart significantly from the expected, given the normal distribution of results for specific degrees of freedom.[16] In this approach positive Z scores are interpreted. But, it is possible to look for negative scores. In this case, the observer searches for correlations which are lower (that is closer to zero) than would be normally expected with this size sample. These negative Z scores would signal correlations which are so small as to be highly unlikely to occur in a random comparison of conflict sent and received. It would be appropriate to assume that the occurrence of such a score is brought about by the analyst's choice of aggregating his data or by some other artifact of the analysis. This question can be examined in conjunction with the Z transformation scores in Tables I - V in the appendix. These scores are transformations of the chi square test of significance for each

of the canonical correlations. No high negative scores occurred. Consequently we cannot assume that this form of error is seriously affecting the results.

The other possibility is that the New York Times is sufficient as a data source only for aggregations at the yearly level. This question is essentially unanswerable at this stage. 'Sufficiency' must be related to the model one is dealing with. At this stage it is too early to reject the data source. More analyses are needed on conflict data organized in monthly aggregations before we can really get a feel for this problem. One avenue open to the analyst is to change the level of aggregation from nation to dyads. Yet another possibility is to look for other forms of relationship; perhaps the relationships are more complex than those specified here. The possibility also exists that certain nations show a strong relationship between conflict sent and received while others do not. In this case a classification system is needed which explained why some nations show regular input-output relationships while others do not. Any of these possibilities are as likely as assumptions about the data source itself and deserve investigation, prior to rejecting the source of data.

Even though the two spaces are not highly related there may well be patterns within the two that are highly related. If so, certain variates would show high correlations, while others would not. Tables VIII - XII in the appendix list the correlations between variates in each of the models. Canonical analysis produces correlations between variates which are in descending order of the amount of variance explained. Generally speaking, the correlations are all below .50, or less than twenty-five percent of the variance in conflict variates in one matrix is related to variance along variates of conflict in the second matrix. The exceptions to this conclusion

occur in the analysis of trends in conflict received and in the simultaneous conflict interaction model. In these cases, the first variates account for more than fifty percent of the variance. Thus, there are relationships worth discussing within each of these spaces.

Table VI presents the first canonical relationships in each of the models. The canonical correlation is between variates formed by these weighted combinations of variables. In the first case (A) there is a strong tendency to continue receiving negative communications over time. This tendency also shows a slight relationship between negative communications and unofficial violence. It is likely that a subset of nations receiving negative communications also experience a similar trend in the reception of unofficial violence. The strongest trend in conflict sent seems to be the tendency to send Military Violence from one period to the next. The inverse relationship of signs between negative communications and military violence shows that nations tend not to engage in verbiage when heavily involved in military conflict.

Turning to the first canonical variates of interaction sequencing (C - E), the coefficients show that military violence received and sent account for the strongest relationship. In the lagged models, there is a slight inverse relationship between military violence and negative communications. Again this is interpreted that those nations which receive or send military violence do not tend to receive or send negative communications. Thus, nations primarily involved in military conflict do not customarily employ negative communications nor are these nations likely to have received high amounts of negative communications just prior to becoming militarily involved.

The second set of relations--corresponding to the second pair of

TABLE VI

CANONICAL CORRELATION	THE STRONGEST CANONICAL VARIATES OF CONFLICT DYNAMICS[17]
.76	.87 Negative Communications + .47 Unofficial Violence received in t_1 ≐ .81 Negative Communications + .54 Unofficial Violence received in t_2
.63	-.52 Negative Communications + .85 Military Violence sent in t_1 ≐ -.56 Negative Communications + .83 Military Violence sent in t_2
.89	.99 Military Violence sent in t_1 ≐ .99 Military Violence received in t_1
.61	-.41 Negative Communications + .89 Military Violence received in t_1 ≐ -.36 Negative Communications + .92 Military Violence sent in t_2
.63	-.33 Negative Communications +.92 Military Violence sent in t_1 ≐ -.34 Negative Communications +.92 Military Violence received in t_2

canonical variates in each of the five models--are somewhat more complex. Table VII gives the coefficients for each case. There is quite a spread in the amount of relationship between conflict sent and received at this stage. The range in variance in common between the pairs of variates is from twenty-five to fifty percent. With the exception of the trend in conflict received these variates all highlight the role of negative communications. They also indicate that contrary to the simple relationship between military violence sent and received, negative communciations tend to have variance in common with a number of other variables.

The explanation of variance in military violence associated with these variates is the opposite of its role in the first set of variates. Here, military violence varies directly with negative communications. It would appear that those nations which send predominantly negative communications also employ some military violence. On the other hand, nations which have most of their variance devoted to military acts from period to period are not likely to send negative communications. Substantively, it is argued that nations at a low level of violence--relatively small amount of conflict associated with military violence--are quite likely to engage in other forms of diplomatic conflict, for example, threats, accusations, diplomatic rebuffs, etc. But as nations become increasingly violent, and the violence holds from period to period, they no longer engage in discussion. Then most of the variance is associated with military violence.

In the interaction models (C - E) the simultaneous model shows no associations of diplomatic variables with military actions. In this case, the intermixing of both forms of diplomatic activity sent and received is virtually independent of military violence. However, in the lagged models, D and E, military violence and even unofficial acts of violence appear.

TABLE VII

CANONICAL CORRELATION	THE SECOND CANONICAL VARIATES OF CONFLICT DYNAMICS
.60	.99 Military Violence received t_1 ≐ .99 Military Violence received t_2
.53	84 Negative Communications + 52 Military Violence sent in t_1 ≐ 81 Negative Communications + 56 Military Violence sent in t_2
.70	.87 Negative Communications + 43 Negative Sanctions sent t_1 ≐ .80 Negative Communications + 50 Negative Sanctions received in t_2
.50	.79 Negative Communications + .45 Military Violence + .40 Negative Sanctions received in t_1 ≐ 86 Negative Communications + .39 Military Violence sent in t_2
.51	Negative Communications + 39 Military Violence + .60 Negative Sanctions sent in t_1 ≐ .76 Negative Communications + .37 Military Violence + 51 Unofficial Violence received in t_2

No attempt will be made to interpret the other variate pairs. The relationships between conflict sent and received was too small to permit conclusions. The complete canonical coefficient matrices are reported in Tables VI - X of the Appendix.

The results point to a number of conclusions. To begin with, a good deal of variance in monthly conflict received is not related to conflict sent by nations. It is felt that a relationship might be found on a monthly level if the unit of analysis is shifted to the dyad. The results here point to an instantaneous relationship between input and output. The models which took the positions that either nations were responding to conflict received or that the conflict they received was in response to that which they sent were less effective in explaining relationships than the simultaneous model.

At the specific variables level, it appears that military violence is responded to automatically, that the relationship holds over time and is unrelated to other forms of conflict behavior.

Negative communications sent and received tend to have a good deal of variance in common. Here, there is a tendency to mix in negative sanctions and even some military violence. Thus, the two strong relationships between conflict sent and received seem to be underscoring two patterns of behavioral exchanges. One is a highly violent, quite simple exchange of military violence and the other is a much more complex, slightly weaker association of a diplomatic nature. In the second case, there is still, however, a rather strong relation between sent and received behavior. In the case of unofficial violence and sabre rattling, the response is quite definitely not automatic. Responses are not routine, but are most likely specific to the situation.

In the lagged cases, the relationship between military violence sent and received is still quite important and is negatively associated with [illegible] communications, when the major variance in input and output relationships is due to official military actions. But the diplomatic aspects of conflict--negative communications and negative sanctions--show much more complex patterns and a low level of relationship from one time period to the next. It appears that military violence has a clear stability over time but that lesser forms of conflict are either responded to immediately or are not responded to in a systematic fashion at this level of aggregation.

CONCLUSION

Nations tend not to respond to conflict in any of the simple ways suggested by this analysis. What has been shown here is that the search for explanations of monthly conflict exchanges should take other directions. While it appears that a good deal of variation in monthly conflict sent or received is independent of the explanations laid out here, there are certain regularities which suggest further work along the "behavior begets behavior direction" is potentially rewarding. One important point is the regularity found previously on yearly data. Secondly there are the individual relationships found in this work.

The suggestion by Holsti, Brody and North when commenting on [illegible] study of negative and hostile statements, is upheld in this research. That is reciprocity are an integral part of conflict interaction. In fact, military acts of violence are negatively related to the prior exchange of verbal or written communications. This research has highlighted the relationship between military acts sent and received and between a combination of negative communications and negative sanctions. In comparing the

Holsti et al. findings of a lack of relationship between stimulus and response with the opposite findings reported by Azar, it appears that while at the systemic level and within certain subsystems there are definite interaction patterns, the use of multiple, uncorrelated indicators of conflict behavior in this study points out that a number of relationships between conflict sent and received are quite independent of each other.

There has been a growing interest in the relationship between conflict sent and received to which the present results relate. Charles A. McClelland has suggested the tendency of nations in conflict to engage in trade off sequences with their environment:

> 'Outputs' received from the occurrences and situations in the international environment and from sequences of international interactions are processed by the advanced modernizing social organization according to their perceived characteristics: if these outputs are recognized as familiar and expected experiences met repeatedly in the remembered past, they will be treated in a highly routine fashion. (1961, p. 199)

John Burton similarly states: "States are political systems operating within an environment of other systems to which they are adapting and responding:". (Burton, 1969, p. 10)

Triska and Finley (1965) have attempted to explain Soviet-American relations by resorting to a similar metaphor. They draw upon the theory of Eugene Dupréel (1948), who suggested that opponents in a conflict must employ the same means to meet and neutralize each other. If they do not, the side which fails to match the other side's shift in strategy is doomed. While Dupréel's theorem was specific to weapons systems, Triska and Finley suggest that it is generalizable.

> "In fact we submit that the stimulus-response sequence, upon which Dupréel's theorem is founded, is a basic propensity of

> most interactions encompassed in the East-West dialogue to which we conveniently refer as the Cold War, a propensity by now so well established that any stimulus inserted into the process by one of the opponents may be expected to bring about a proportionate response in kind from the other. If the multiple symmetry model we are about to construct is indeed a simplified description of reality, it should fit not only the military subsystem at two different levels but other subsystems within the conflictual interaction process as a whole."

In part these suggestions do fit the data for 1963. The multiple symmetry model explains what McClelland refers to as routine conflict interactions--routine in the relationship of input to output. Nations which receive military violence respond militarily. There is also a moderate correlation between linear combinations of diplomatic activities sent and received, but these combinations are more complex. In this sense, it is routinized--almost automatic.

The model clearly does not fit all indicators of conflict exchanges with the environment. At least sixty percent of the variance in conflict sent is independent of that received. It does provide a means for a partial understanding of the complex processes involved in the dynamic system of conflict behavior especially at the systemic and aggregate level of analyses. And it also suggests that fruitful findings await analysis of dyadic conflict exchanges. In this case the conflict behavior of one nation would depend upon a specific opponent's demand and responses. Another possibility that seems worth pursuing is the search for parameter weights which are specific to each nation. It was suggested before that some nations respond immediately while others take longer. Predicting these types of strategies will probably require shifting the level of analyses to a specific actor framework.

NOTES

[1]These findings do not mean that the responses were identical in amount however. The techniques of analysis employed permit only statements about pattern similarity and not magnitude relationships.

[2]The logic for this work is identical with the earlier paper. Thus, some of the introduction of concepts and data presented here is paraphrased from the earlier paper.

[3]Boulding reiterates the aspects of a dynamic analysis: "A dynamic process is a succession of states, S_1, S_2, ... S_n, of a system at successive points in time. Dynamic systems are present if there are patterns in the succession of states. The simplest of these patterns is the difference equation, or the differential equation, but of course many other patterns are possible." (1969, p. 98)

[4]"States are political systems operating within an environment of other systems to which they are adapting and responding." (Burton, 1969, p. 10)

[5]"An organism that is impelled from within but is relatively insensitive to environmental stimuli or to the immediate consequences of its actions would not survive long. Human functioning, in fact, involves interrelated control systems in which behavior is determined by external stimulus events, reinforcing response-feed back processes." (Bandura, 1969, p. 19)

[6]The term "relative" is important here because it is the amount of conflict relative to other nations that is being compared and not the absolute amount of conflict.

[7]I am taking an international relations stance here as opposed to an area approach which would obviously limit analysis to a selected set of nations. For a discussion of the techniques of grouping nations by quantitative methods, see Phillips (1969b).

[8]For a discussion of the technique see Cattell (1967) and Phillips (1969).

[9]No transformation of the variables were employed.

[10]For a discussion of the choice of the number of factors, see Rummel (1970).

[11]Margenau (1950, p. 171ff) suggests that theories contain three cardinal elements, *systems*, *observables*, and *states*. State variables are that crucial set of variables which change values over time and in combination allow us to specify the *state* of the object or concept being analyzed at any given point in time.

[12]The trace correlation squared records the percent of variance in common between the two studies (Hooper, 1959).

[13]I am reviewing the regression model here prior to presenting the canonical model because it should provide a convenient bridge for those only familiar with regression techniques.

[14]I am developing this model for the interaction aspects of conflict. I will be matching lagged trends in conflict sent and received. The model will be the same except equation one would then be

$$S_{nxq_{t(2)}} = S_{nxq_{t(1)}} P_{qxq}$$

for the analysis of conflict sent trends and

$$R_{mxp_{t(2)}} = R_{mxp_{t(1)}} P_{pxp}$$

for the analysis of trends in conflict received. The development of the rest of this section would follow along the same path.

[15]r and q are general identifications of specific column vectors.

[16]The degrees of freedom = [p - (k - 1)] [q - (k - 1)].

[17]The symbol $\doteq$ is used to mean about equal since I am only reporting coefficients which have 15 percent of their variance associated with the variate.

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APPENDIX I

Canonical Correlations For Trends in Conflict Sent

NUMBER OF EIGENVALUES REMOVED	EIGENVALUE	CORRESPONDING CANONICAL CORRELATION	LAMBDA	CHI-SQUARE	DEGREES OF FREEDOM	Z-TRANSFORMATION FOR D.F.>30
1	0.40	0.63	0.40	644.94	25	28.91
2	0.28	0.53	0.67	282.49	16	18.20
3	0.04	0.20	0.94	47.24	9	5.60
4	0.02	0.16	0.97	19.67	4	3.63
5	0.00	0.05	1.00	2.02	1	1.01

APPENDIX II

Trends in Conflict Received

NUMBER OF EIGENVALUES REMOVED	EIGENVALUE	CORRESPONDING CANONICAL CORRELATION	LAMBDA	CHI-SQUARE	DEGREES OF FREEDOM	Z-TRANSFORMATION FOR D.F.>30
1	0.58	0.76	0.25	996.48	25	37.64
2	0.36	0.60	0.59	372.96	16	21.74
3	0.06	0.24	0.93	55.09	9	6.37
4	0.02	0.13	0.98	12.49	4	2.35
5	0.00	0.03	1.00	0.49	1	-0.01

APPENDIX III

Simultaneous Conflict Exchanges

NUMBER OF EIGENVALUES REMOVED	EIGENVALUE	CORRESPONDING CANONICAL CORRELATION	LAMBDA	CHI-SQUARE	DEGREES OF FREEDOM	Z-TRANSFORMATION FOR D.F.>30
1	0.78	0.89	0.09	1888.30	25	54.45
2	0.49	0.70	0.40	700.41	16	31.86
3	0.15	0.38	0.79	181.13	9	14.91
4	0.06	0.25	0.93	57.97	4	8.12
5	0.01	0.11	0.99	10.02	1	3.48

APPENDIX IV

National Reaction to Conflict

NUMBER OF EIGENVALUES REMOVED	EIGENVALUE	CORRESPONDING CANONICAL CORRELATION	LAMBDA	CHI-SQUARE	DEGREES OF FREEDOM	Z-TRANSFORMATION FOR D.F.≥30
1	0.38	0.61	0.45	568.23	25	26.71
2	0.25	0.50	0.72	231.45	16	15.95
3	0.03	0.18	0.96	27.04	9	3.23
4	0.01	0.08	0.99	4.65	4	0.40
5	0.00	0.01	1.00	0.08	1	-0.59

APPENDIX V

Environment's Reaction to National Conflict

NUMBER OF EIGENVALUES REMOVED	EIGENVALUE	CORRESPONDING CANONICAL CORRELATION	LAMBDA	CHI-SQUARE	DEGREES OF FREEDOM	Z-TRANSFORMATION FOR D.F.≥30
1	0.39	0.63	0.39	659.23	25	29.31
2	0.26	0.51	0.65	304.21	16	19.10
3	0.11	0.33	0.88	90.56	9	9.34
4	0.01	0.10	0.99	7.11	4	1.12
5	0.00	0.01	1.00	0.06	1	-0.65

APPENDIX VI

CANONICAL COEFFICIENTS FOR TRENDS IN CONFLICT SENT

	Conflict Sent Time 1	Canonical Variates				
		1	2	3	4	5
1	Negative Communications	.52	.84	-.03	.18	-.03
2	Official Acts of Violence	-.85	.52	-.01	-.04	-.14
3	Unofficial Acts of Violence	-.05	-.10	.69	.67	-.25
4	Negative Sanctions	.12	.12	.67	-.72	-.10
5	Saber Rattling					

	Conflict Sent Time 2	Canonical Variates				
		1	2	3	4	5
1	Negative Communications	.56	.81	.01	.18	.04
2	Official Acts of Violence	-.83	.56	.01	08	-.07
3	Unofficial Acts of Violence	.02	-.13	.53	.64	-.54
4	Negative Sanctions	.07	.12	.41	-.75	-.51
5	Saber Rattling	-.04	.01	.74	-.05	.67

APPENDIX VII

CANONICAL COEFFICIENTS FOR TRENDS IN CONFLICT RECEIVED

	Conflict Received Time 1	Canonical Variates 1	2	3	4	5
1	Negative Communications	-.87	.01	.16	-.26	.39
2	Official Acts of Violence	.04	-.99	.08	-.12	-.01
3	Saber Rattling	.05	-.06	.38	.79	.49
4	Unofficial Acts of Violence	-.47	-.11	-.27	.53	-.64
5	Negative Sanctions	-.02	.07	.86	-.11	-.49

	Conflict Received Time 2	Canonical Variates 1	2	3	4	5
1	Negative Communications	-.81	.02	.38	-.28	-.34
2	Official Acts of Violence	.01	-.99	.09	-.05	.05
3	Saber Rattling	.11	-.01	.46	.79	-.39
4	Unofficial Acts of Violence	-.57	-.06	-.54	.54	.30
5	Negative Sanctions	-.08	.10	.59	.04	.80

APPENDIX VIII

CANONICAL COEFFICIENTS FOR SIMULTANEOUS CONFLICT SENT & RECEIVED

	Conflict Received	Canonical Variates 1	2	3	4	5
1	Negative Communications	.06	.81	-.18	.26	-.49
2	Official Acts of Violence	.99	-.06	-.09	.00	.06
3	Saber Rattling	.11	.04	.84	-.34	-.42
4	Unofficial Acts of Violence	.03	.29	.50	.55	.60
5	Negative Sanctions	-.00	.50	-.07	-.72	.48

	Conflict Sent	Canonical Variates 1	2	3	4	5
1	Negative Communications	.03	.87	-.29	-.32	-.23
2	Official Acts of Violence	.99	-.08	-.02	-.02	-.10
3	Unofficial Acts of Violence	-.04	-.00	.78	-.32	-.54
4	Negative Sanctions	.06	.43	.37	.82	.04
5	Saber Rattling	.10	.22	.42	-.35	.80

APPENDIX IX

CANONICAL COEFFICIENTS FOR ENVIRONMENTAL RESPONSE

	Conflict Received	Canonical Variates 1	2	3	4	5
1	Negative Communications	.36	.86	.05	-.20	.31
2	Official Acts of Violence	-.92	.39	-.02	-.04	-.07
3	Saber Rattling	-.11	-.06	-.03	.66	.74
4	Unofficial Acts of Violence	.12	.24	-.71	.49	-.43
5	Negative Sanctions	.07	.21	.68	.54	-.43

	Conflict Sent	Canonical Variates 1	2	3	4	5
1	Negative Communications	.41	.79	.42	-.12	.15
2	Official Acts of Violence	-.89	.45	.01	-.01	.08
3	Unofficial Acts of Violence	.04	-.09	-.20	.05	.97
4	Negative Sanctions	.19	.40	-.88	.06	-.15
5	Saber Rattling	.03	.09	.12	.99	-.03

APPENDIX X

CANONICAL COEFFICIENTS FOR NATIONAL RESPONSE

	Conflict Sent	Canonical Variates 1	2	3	4	5
1	Negative Communications	.33	-.71	-.59	.19	-.01
2	Official Acts of Violence	-.92	-.39	-.07	-.07	.01
3	Unofficial Acts of Violence	-.01	.02	-.02	-.07	-1.00
4	Negative Sanctions	.21	-.60	.74	-.23	-.01
5	Saber Rattling	-.09	-.03	.29	.95	-.07

	Conflict Received	Canonical Variates 1	2	3	4	5
1	Negative Communications	.34	-.76	-.49	.11	-.23
2	Official Acts of Violence	-.92	-.37	-.09	-.01	.02
3	Saber Rattling	-.06	.11	.11	.97	-.21
4	Unofficial Acts of Violence	.12	-.51	.85	-.03	.03
5	Negative Sanctions	.09	-.13	-.13	.23	.95

TABLE XI

PATTERNS OF CONFLICT RECEIVED[a]

	Measures	Unrotated Matrix[b]				
		F1	F2	F3	F4	F5
1	WARNDF	29	16	72	-38	-40
2	ALRTMB	28	14	72	-40	-40
3	PLNVIL	29	89	-08	07	04
4	WARACT	27	91	-10	09	03
5	DISCRA	15	84	-12	13	05
6	DAYVIL	08	59	-09	14	06
7	NEGACT	41	-08	63	36	51
8	UNCNEG	37	-09	25	21	03
9	SEVDPR	16	-05	55	34	38
10	EXPREC	22	-10	09	29	30
11	BCOTEM	08	-05	21	01	34
12	AIDREB	17	24	35	-34	05
13	WRTCOM	91	-12	-17	-25	11
14	ORLCOM	71	-11	-20	-27	33
15	WRTORL	70	-07	-24	-15	-00
16	ACCUSN	85	-14	-23	-17	04
17	PROTST	63	-07	-04	-32	29
18	MINTHM	52	03	-08	-28	19
19	UNOFVL	78	-12	02	34	-39
20	ATKEMB	29	00	29	41	-15
21	ATKPER	58	-16	-13	46	-39
22	ATKFLG	73	-14	-19	24	-31
23	NVIOLB	51	-04	-04	10	-05
% Total Variance		25.1	12.7	10.1	7.7	7.0

[a] Decimals omitted from loadings.

[b] Principal axes technique.

TABLE XII

ROTATED FACTOR MATRIX

	Measures	h^2	Varimax Rotation[a]				
			F1	F2	F3	F4	F5
1	WARNDP	93	04	01	95	15	05
2	ALRTMB	93	05	-02	95	13	03
3	PLNVIL	89	12	93	11	05	-01
4	WARACT	91	10	94	09	05	-02
5	DISCRA	77	01	87	02	01	-03
6	DAYVIL	38	-03	62	-03	00	01
7	NEGACT	96	12	01	16	16	94
8	UNCNEG	25	13	-02	12	33	84
9	SEVDPR	60	-08	-01	12	18	75
10	EXPREC	24	11	00	-17	14	42
11	BCOTEM	17	10	-03	03	-13	87
12	AIDREB	33	17	16	48	-17	11
13	WRTCOM	95	92	02	09	31	06
14	ORLCOM	73	84	01	-04	06	14
15	WRTORL	58	69	05	01	31	-05
16	ACCUSN	82	83	01	02	37	01
17	PROTST	59	74	01	11	01	17
18	MINTHM	39	61	19	11	01	07
19	UNOFVL	89	33	03	11	87	06
20	ATKEMB	36	-10	07	12	49	30
21	ATKPER	75	17	00	-10	84	00
22	ATKFLG	74	43	02	-04	74	-05
23	NVIOLB	27	34	06	02	38	09
% of Total Variance			40.1	20.2	16.2	12.3	11.2

[a] Decimals omitted from loadings.

TABLE XIII

PATTERNS OF CONFLICT SENT[a]

	Measures	Unrotated Matrix[b]				
		F1	F2	F3	F4	F5
1	WARNDF	36	-30	45	05	71
2	ALRTMB	33	-28	39	09	76
3	PLNVIL	30	82	36	03	-01
4	WARACT	28	83	38	01	-00
5	DISCRA	18	79	34	05	-01
6	DAYVIL	13	55	21	01	00
7	NEGACT	49	-30	35	61	-35
8	UNCNEG	41	-21	20	42	-41
9	SEVDPR	19	-27	40	27	10
10	EXPREC	18	-12	07	37	-34
11	BCOTEM	18	-16	10	43	-11
12	AIDREB	20	01	08	26	01
13	WRTCOM	87	-03	-39	-19	02
14	ORLCOM	67	02	-44	-25	-04
15	WRTORL	55	-03	-20	-11	-01
16	ACCUSN	71	02	-39	-20	04
17	PROTST	62	-06	-29	-05	-08
18	MINTHM	45	06	-12	-03	04
19	UNOFVL	17	-33	65	-57	-18
20	ATKEMB	17	-21	46	-32	-25
21	ATKPER	08	-19	44	-40	-25
22	ATKFLG	07	-19	41	-47	-30
23	NVIOLB	14	-05	13	-01	25
% Total Variance		16.0	12.7	12.1	8.7	8.0

[a] Decimals omitted from loadings.

[b] Principal axes technique.

TABLE XIV

ROTATED PATTERNS OF CONFLICT SENT

	Measures	h^2	Varimax Rotation[a]				
			F1	F2	F3	F4	F5
1	WARNDF	93	06	-02	11	08	95
2	ALRTMB	93	06	-03	02	05	96
3	PLNVIL	89	08	94	02	03	03
4	WARACT	91	06	95	03	01	03
5	DISCRA	77	-02	87	-02	00	-00
6	DAYVIL	37	01	60	-02	-02	-01
7	NEGACT	95	11	00	13	95	12
8	UNCNEG	60	15	00	15	74	-06
9	SEVDPR	35	-10	-03	14	41	39
10	EXPREC	31	03	-02	01	53	-14
11	BCOTEM	27	00	-05	-09	51	07
12	AIDREB	12	07	09	-09	29	12
13	WRTCOM	93	96	01	00	07	08
14	ORLCOM	70	83	-01	-01	-06	-06
15	WRTORL	36	59	02	04	07	06
16	ACCUSN	70	84	02	-03	-02	04
17	PRCTST	48	67	-03	-01	16	-01
18	MINTHM	22	44	11	-03	08	09
19	UNOFVL	92	-01	-02	94	-02	21
20	ATKEMB	45	02	02	66	11	06
21	ATKPER	46	-03	01	68	00	02
22	ATKFLG	52	-00	-01	72	-04	-05
23	NVIOLB	10	05	04	02	-01	31
% Total Variance			27.8	22.1	21.0	15.2	13.9

[a] Decimals omitted from loadings.